



## Factors affecting dining satisfaction and acceptability of food item among athletes during a sporting event

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### Abstract

Athletes are a special group of consumers whose specific diet requirement is important during training and competition to ensure their success. As commercial foodservice establishments are increasing involved in providing foods to this group of consumers on one hand and the lack of research investigating the athletes' dining satisfaction, especially meeting their diet requirement on the other hand, this study was conducted to investigate the influence of nutritional factors in athletes' dining satisfaction and the acceptance of various foods provided in an international sporting event. Following a stratified random sampling, 700 athletes were selected from the entire population of 1330 participants. The final usable sample size was 450 (64.3% response rate). Regression analysis revealed that overall service, overall food quality, grooming of server, and nutritional information tag significantly influence the overall dining satisfaction among athletes. In addition, nutritional value, menu variety, fat content, freshness, and taste were found as the most important determinant in almost all food categories. It is intriguing that meeting diet requirement is not a significant factor but nutritional information tag is. Important implications were discussed. Nutrition education is recommended for foodservice operators especially when they are involved in providing food for sporting events. It is advisable that an appointed specialized sport dietitian or nutritionist to a sporting event works together with the foodservice operators to ensure that the menu meets the nutritional requirement of athletes.

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### Introduction

Athletes are trained to win in competition. Compared to ordinary people, their energy demand is higher in order to maintain their performance. During training, both the coaches and sport science personnel will work together to ensure that the diet program meets the training requirement. However, when the athletes are away participating in a sporting event, they have to depend on the organizer to provide foods meeting their dietary requirements.

In elite sports, whereby highly talented, motivated and well trained athletes meet, the margin between victory and failure is just a thin line. Attention or alteration to detail, as well as food choice, can make the vital difference. Indeed, the food that the athletes consume during training and competition will affect their performance (Maughan *et al.*, 2006).

Unfortunately, many of the sporting organizers do not employ a foodservice dietitian. The dietary need of the athletes was often overlooked. For example, the foods served during a competition were found high in fat, sugar and salt, contradicted to the sports nutrition principles (Cummings *et al.*, 2006). The low nutritional food quality served in the sporting event was also substantiated by Malaysian athletes

participated in the Sukan Malaysia (SUKMA) 2010 (National Sports Council of Malaysia, 2010). The athletes commented that the foods were high in fat but low in protein, spicy, not fresh, and not meeting their diet requirement. They also recommended the food be served in buffet style so that they could pick their food according to their recommended energy intake.

In addition, foodservice providers cater for athletes may also pay attention to the sensory quality. Previous research has highlighted that the food presentation, variety, healthy options, taste, freshness, and temperature are among the important food quality attributes. Reichler and Dalton (1998) stated that the taste and other sensory appeals of the food could strongly influence the athlete food selection. Hence, if the food is unappealing, the athletes may not consume it despite its nutritional value.

In foodservice operations, food quality is a necessary condition to satisfy the needs and expectations of customers (Peri, 2006), a significant determinant of customer assessments of restaurants in Toronto, Canada (Susskind and Chan, 2000), and a fundamental element of the overall restaurant experience (Kivela *et al.*, 1999; Raajpoot, 2002; Sulek and Hensley, 2004).

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Besides food quality, the dining environment (Peri, 2006; Ryu and Han, 2010), the menu variety (Sulek and Hensley, 2004), the dining occasion (Auty, 1992), the health status (Kivela *et al.*, 1999; Kim *et al.*, 2009) and mood (Ha and Jang, 2010) were also found contributing to the expected dining experience and satisfaction. Kivela *et al.* (2000), on the other hand, documented that comfortable dining environment, in addition to menu variety, nutritious food, and food taste, contributed to the consumers' evaluation towards a dining establishment. The importance of physical environment on the perceptions of overall service encounter quality and customer satisfaction was also further supported (Kotler, 1973; Parasuraman *et al.*, 1988; Bitner, 1990; 1992; Brady and Cronin, 2001; Ryu and Jang, 2007).

Taken together, the objectives of the current study are twofold. First, it aims to investigate if athlete dining satisfaction during an international sporting event is influenced by the nutritional factors. Second, it intends to determine the importance of nutritional factors in the athletes' evaluations towards the acceptability of various foods provided in the international sporting event.

## Method

### *Population and sample size*

The study population was participants from 10 countries (i.e., Brunei, Cambodia, Indonesia, Laos, Malaysia, Philippines, Singapore, Thailand, Timor Leste, and Vietnam) in the ASEAN University Games 2008, Kuala Lumpur. Based on the previous record of participants ( $N = 2000$ ), the estimated sample sizes for 3% and 5% error rate are 714 and 333, respectively (Yamane, 1967). The samples were selected using a stratified random sampling since the researchers were given the list of participants of the sporting event.

### *Data collection procedure*

Twenty national athletes who shared the same background (i.e., had traveled abroad before, participated in international competitions, exposed to nutritional education program) as the participants in the actual study and had their meals in the similar foodservice setting were recruited in a pretest to validate the measurement and to ensure the clarity of questionnaire. Feedback from the athletes indicated that no changes to the questionnaire were needed and they could complete it within 15-20 minutes. However, several terminologies related to food sensory were unfamiliar to them. Thus, explanations to the terminologies were provided in the actual

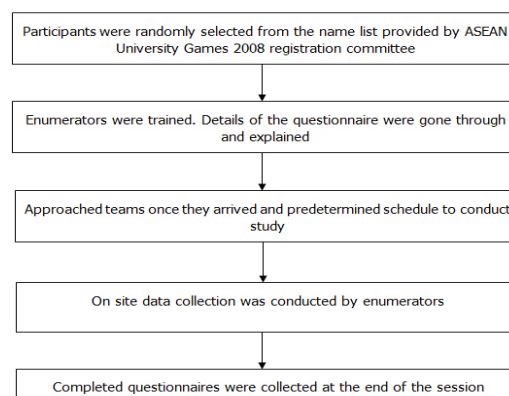


Figure 1. Flow chart of data collection procedures

study.

The actual data collection was executed at various venues where the event participants stayed from 11 to 16 December 2008. Enumerators were trained to interview the participants prior to the data collection. On site data collection was conducted. Details of the survey procedure are as describe in Figure 1.

### *Research instrument and measurement*

The current study employed a field survey design. Questionnaire consisted of three sections were pretested. The first section aimed to determine respondents' satisfaction towards their dining experience. Eight items related to food (i.e., overall food quality, meeting participants' diet requirement, availability of nutritional information tag), employee (i.e., grooming of server, overall service), environment (i.e., buffet line arrangement, cleanliness of cutleries, availability of appropriate cutleries), and one question on overall dining satisfaction were constructed from previous research (Oliver, 1999; Yuksel and Yuksel, 2002; Namkung and Jang, 2009). All items were measured using 10-point scale anchored at 1 for extremely dissatisfied and 10 for extremely satisfied.

Questions in the second section were intended to determine the effect of food nutritional and sensory on the respondents' acceptance of the food provided during the sporting event. Nine types of food categories (salad, soup, cooked vegetables, rice/bread/substitutes, meat/poultry, fish/seafood, fruits, desserts and beverages) were evaluated. Food sensory attributes were adopted from previous research (Andaleeb and Caskey, 2007; Namkung and Jang, 2007; Kim *et al.*, 2009). The evaluation on temperature, color, taste, freshness, and texture were executed for all types of food while juiciness was specific to meat/poultry and fish/seafood. Three nutritional attributes (menu variety, general nutrition value, fat content) and the general acceptability were also included for all types of food in the questionnaire. The sensory attributes were measured using 10-point

scale (1 = extremely undesirable, 10 = extremely desirable) while the nutritional attributes and general acceptability were measured with scale anchored at 1 (extremely unacceptable) and 10 (extremely acceptable).

## Results

### Respondents profile

Based on the earlier calculation, 700 athletes were selected using stratified random sampling method from the entire population of 1330 participants. However, the final usable sample size was 450 with a response rate of 64.3%. The omission was due to inability to locate participants, rejection from participants, and incomplete questionnaire.

The number of participants in the study is shown in Table 1. Being the hosting country, Malaysia had the highest number of athletes. Thus, the sample was also the highest ( $n = 202$ ), followed by Singapore ( $n = 91$ ) and Thailand ( $n = 88$ ). Participants from Indonesia ( $n = 66$ ), Philippine ( $n = 11$ ) and Brunei ( $n = 10$ ) were excluded due to the low number. On the other hand, respondents from Vietnam ( $n = 30$ ), Cambodia ( $n = 7$ ), Laos ( $n = 18$ ), and Timor Leste ( $n = 14$ ) were combined and labeled as Less Developed Countries (LDC) according to the Human Development Index (HDI).

### Factors influencing dining satisfaction

To address the first objective, the ordinary least squares regression analysis was performed. Results of the analysis (Table 2) revealed that the regression model explained 78.7% of the total variance. Overall service ( $\beta = .409$ ,  $p = .000$ ), overall food quality ( $\beta = .215$ ,  $p = .000$ ), and grooming of server ( $\beta = .168$ ,  $p = .000$ ) significantly influenced the overall dining satisfaction. Although meeting diet requirement ( $\beta = .063$ ,  $p = .166$ ) did not affect the athletes' dining satisfaction, nutritional information tag ( $\beta = .094$ ,  $p = .006$ ) did.

### Effect of food nutritional and sensory quality on general acceptability

The second objective of this study was to determine if the nutritional factor influences the athletes' food acceptance. A series of regression analyses was performed for the nine types of food category. Results of the analyses (Table 3) show that nutritional value of food was indeed an important factor affecting the acceptance of all types of food category ( $ps < .05$ ). Menu variety, which is important to offer complete nutritional value of a meal, is also a significant factor ( $ps < .05$ ) in all food categories,

Table 1. Respondent's profile

Country	Population (N = 1330)		Sample (n = 450)	
	Count	(%)	Count	(%)
Malaysia	388	29.2	202	44.9
Singapore	174	13.1	91	20.2
Thailand	206	15.5	88	19.6
Less Developed Countries	201	15.1	69	15.3
<b>Gender</b>				
Male	892	67.1	286	63.6
Female	438	32.9	164	36.4
<b>Sports</b>				
Individual	651	48.9	255	56.7
Team	679	51.1	195	43.3

Table 2. Regression analysis of factors affecting overall dining satisfaction

Factors	$\beta$	t	p
Overall Food Quality	.215	4.394	.000
Meeting Diet Requirement	.063	1.387	.166
Buffet Line Arrangement	.026	.644	.520
Cleanliness of Cutleries	-.028	-.710	.478
Availability of Appropriate Cutleries	.038	.936	.350
Nutrition Information Tag	.094	2.759	.006
Grooming of Server	.168	3.854	.000
Overall Services	.409	8.809	.000

Table 3. Regression analysis of food attributes affecting the acceptability of nine types of food category

Food Attributes	Food Category							
	Salad	Soup	Vegetables	Rice/Bread/ Substitutes	Meat/ Poultry	Fish/ Seafood	Fruits	Desserts
Temperature	-	.102**	-	-	-	-	-	.106*
Colour	-	.105**	-	-	.103*	-	.200**	-
Taste	.264**	.171**	.189**	.148**	.220*	.119*	.326**	.129*
Freshness	-	-	-	.213**	.160**	-	.206**	.209**
Texture	-	-	.320**	-	-	-	-	-
Juiciness	-	-	-	-	-	.110*	-	-
Menu Variety	.265**	.109*	.142**	.187**	.118**	.216**	.184**	.146**
Nutrition Value	.274**	.383**	.184**	.306**	.285**	.356**	.462**	.198**
Fat Content	.110**	.059**	-	-	.083**	-	.115**	.054*
R <sup>2</sup>	.732	.805	.804	.792	.802	.829	.809	.824

\*Statistically significant at  $p < .05$ ; \*\*Statistically significant at  $p < .01$

except Beverage. In addition, fat content also exerted significant effect on acceptance ( $ps < .05$ ) for all, except Vegetable ( $p > .05$ ), Rice, Bread and Substitutes ( $p > .05$ ), Fish and Seafood ( $p > .05$ ), and Fruit ( $p > .05$ ).

Among the sensory factors, taste and freshness are the two most critical factors. With the exception in Fruits, taste was found significantly influencing the acceptance of food among the athletes ( $ps < .05$ ). Freshness was an important attribute for rice/bread/substitutes ( $p < .05$ ), meat/poultry ( $p < .05$ ), fruits ( $p < .05$ ), and beverages ( $p < .05$ ).

## Discussion

This study showed that overall service, overall food quality, grooming of server, and nutritional information tag significantly influenced the athletes' dining satisfaction. The importance of food quality and service quality is in line with many of the previous studies (Pettijohn *et al.*, 1997; Qu, 1997; Kivela *et al.*, 1999; Lee, 2004). The critical role of service staff's grooming, though was not documented as a factor in generally, could be attributed to its association with food safety (Perlik, 2002) and professionalism (Chow *et al.*, 2007).

In this study, nutritional factor was expected to be crucial to the respondents, especially during competition of a sporting event. As stated by Pelly and Burkhart (2013) that athletes from specific sports

are known to follow particular dietary practices based on the physiological needs or culture of their sports. However, only the nutritional information tag was found significant. This result is consistent with the finding by Lee (2004) who demonstrated that nutritional information was one of the influential factors in determining the satisfaction level of a different group of consumers, college students. Furthermore, meeting nutritional requirement may not be critical in the current study because the food provided was in buffet style. Respondents could easily attain the needed nutrition from the variety of menu. This explanation was further supported by the significant effect of menu variety on the athletes' food acceptance.

Hence, what is more critical is the availability of nutritional information displayed on the buffet line so that the athletes could make an informed food choice (Pelly and Burkhart, 2013). The importance of information in consumer decision making is well recognized. Consumers will activate the information search process and compare the alternatives before making purchase decision. In the current context, a large variety of food was offered to the athletes during dining. The nutritional information of the food menu was needed so that they could compare the nutritional value of foods and chose the items that meet their requirement. Athletes are aware of their personal goals and know how to select an eating strategy to meet their goals (Maughan *et al.*, 2006).

The importance of food nutritional value among athletes was also substantiated from the analysis on the general acceptance of food. Besides menu variety, this study also shows that nutrition value and fat content influenced athletes' general acceptability. On the other hand, food taste was the only sensory attribute that has exhibited its impact. This finding is in line with Pelly *et al.* (2006) who acknowledged that nutrient composition has more influence on food choice than sensory factors have for athletes competing in team, weight category, and endurance sports at a similar event.

## Conclusion

This study intended to determine the importance of food nutritional value in athletes' dining satisfaction and food acceptance evaluations among athletes participated in an international sporting event. Nutrition professionals recognize that successful dietary guidance must consider the individual taste and food preferences or the nutrients recommended will not be followed (Hoolihan, 2003). Although meeting diet requirement was not found

significant, the availability of nutritional information was important factor affecting athletes' dining satisfaction. In fact, athletes had evaluated not only nutrition value and fat content but also menu variety and taste as the important attributes influencing their general acceptability of the food provided in a sporting event.

This study has three important implications for foodservice operators, particularly for sporting events. First, the foodservice managers should identify the customer needs. In this study, subjects were athletes who participated in competitive games. The energy demand of training for athletes must be met to maintain their performance capacity and to prevent excessive fatigue (Bangsbo *et al.*, 2006). In an unfamiliar environment, nutritional label becomes an effective way of providing information on the nutrient composition of each menu item (Pelly and Burkhart, 2013).

Second, the foodservice managers should recognize that athletes are a special group of consumers who require specific diet. In this study, respondents has evaluated nutrition value, menu variety, taste and fat content as important food quality determinant in almost all food sections. As stated by Smart and Bisogni (2001), one of the key determinants of food choice during competition were health beliefs and effects of diet on performance, compared with taste during the off-season. Athletes also rate nutrient composition as having the greatest effect on food choice (Pelly *et al.*, 2006). Owing to their higher levels of activity, athletes have special energy and nutrient needs in comparison to the general population (Brotherhood, 1984). Therefore, understanding the athlete's specific diet requirement will assist the foodservice providers to provide the right menu that meet the athletes' diet requirement, which in turn will influence their evaluation of overall dining satisfaction.

Third, service quality and customer satisfaction have increasingly been identified as main factors for competitive differentiation (Seyanont, 2007). A better understanding of consumers' evaluations allows a business to differentiate themselves from their competitors, offer higher satisfaction, and ultimately improves business performance (Jang, 2009).

## Limitations and suggestions for future study

The following limitations of this research should be borne in mind. First, the data was collected only for an international sporting event, the ASEAN University Games (AUG) in 2008. The application of the results may be limited in terms of the generalizability.



Replications could be undertaken at the similar event in other ASEAN countries to monitor the changes in athletes' preference or at other games such as Le Tour De Langkawi (Cycling), Kuala Lumpur International Marathon (Marathon), and Monsoon Cup (Yacht) hosted by Malaysia to compare the differences among the different athlete groups.

Second, another limitation lies in the specific group of consumers. Although athletes are generally referred as consumers who have special dietary needs, their needs are different from that of the elderly, growing children, and patients. Thus, future study may expand the research avenue to include the various groups of consumers with special dietary needs.

Third, the limited items used in the current study may not be sufficient to reflect the complete factors affecting dining satisfaction. Future study should comprise more comprehensive measurements that signify the multidimensional nature of service factor, environmental factor, product factor, and employee factor.

Finally, the usefulness of nutritional information provided during a sporting event is dependent upon the nutritional knowledge among consumers. As demonstrated by Fatimah *et al.* (2008), consumers' nutritional knowledge is critical in their food choice decision making.

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